US Army Corps of Engineers

Emergency Management

DEBRIS PLANNING and OPERATIONS

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Sectoring Methodology

- Sectoring is dividing the disaster site into manageable contract areas.
- Required when quantities exceed 2 million C.Y. or where politics dictate i.e. county, city, or municipality lines.
- One or more sectors may be managed by an Emergency Field Office.
- One or more sectors may have the same contractor, however, recommended one contract per sector.

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Planning Methodology

Parameters/Assumptions:

120 Day Removal Mission (Example)

2,000,000 cy per sector and one Debris Management Site per sector

A 4 C.Y. loader will load a 20 C.Y. truck in 8 min.

Average haul distance is 15 miles

12 hour work day

Incineration rate = 160 C.Y. per hour, 24 hour operation

160 x (24-5)19 hrs/day = 3000 C.Y./day

Grinding rate = 180 C.Y. per hour, 10.5 hour operation

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Planning Methodology

Calculations: Curbside Loading

Loading = 60min / 20 min/load = 3 loads per hour
Assuming 30 min for lunch,

12 –0.5 = 11.5 hrs (3) = 34.5 loads per day per crew
34.5 loads x 20 cy per load = 690 cy per day per crew

Truck time, 15 mile haul
= 20 min load, 25 min trvl, 15 unload, 22 min retrn = 82 min, 82/20

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Planning Methodology

Calculations: For 20 minute load time

690 cy per day per crew
5 trucks per crew

2,000,000 C.Y. / 120 days for mission = 16,667 C.Y./day

16,667 C.Y./690 = 24.2 or 25 crews

25 crews x 5 trucks/crew = 125 trucks

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Organizational Requireme

Change any of the variables/ assumptions and it will change the requirements which will change personnel numbers.

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DEBRIS REMOVAL SPECIAL TOPICS

- ***Trees / stumps***
- ***Sunken Vessel/Boat Removal***
- ***Trees off of houses***
- ***Carcass Removal***
- ***Building Demolition***

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HOUSEHOLD HAZARDOUS WASTE

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CURBSIDE PICKUP

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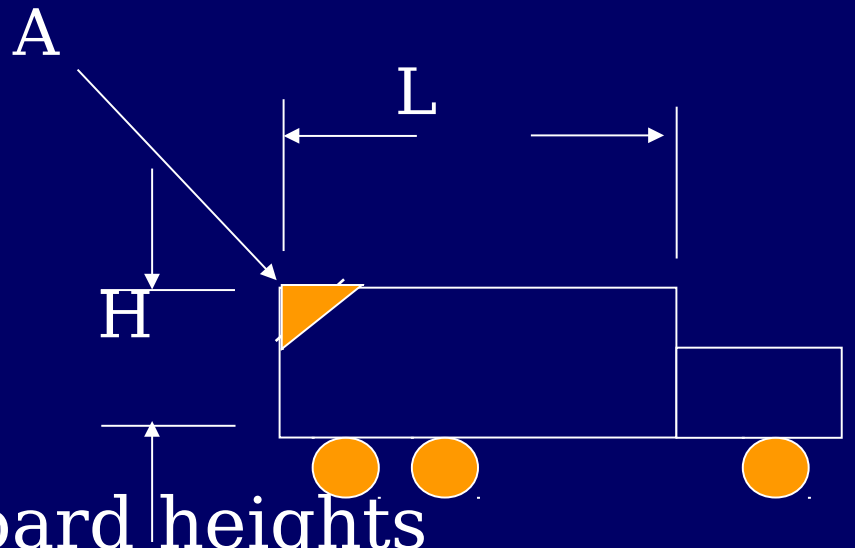
TRUCK VOLUME

$$V = \frac{LWH}{27}\ ft^3 - A$$



- Watch excessive board heights
- Watch removal of sideboards after measuring
- Reduce Volume for hydraulic line box, etc.

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LESS THAN FULL LOAD

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DEBRIS MANAGEMENT SITE SELECTION

- Size (approx 16,000 CY debris = 1 acre if stacked 10 ft high) + room for roads, staging, etc
- Public land preferable
- Wetlands, vegetation, NEPA, baseline surveys
- Proximity to housing, schools (esp. w/incineration)
- Right-of-entry and boundaries established

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DEBRIS MANAGEMENT SITE SIZE REQUIREMENTS

- 16,000 CY to 1 acre @ 10 ft high (Note: can go higher; need 'thumbs' for excavators)
- Assume 40% for debris and 60% for roads, buffers, staging, operations, etc
- Example: Quantity estimate = 450,000 CY

  450,000 CY/16,000cy per acre = 28 acres

  If 28 acres = 40% of total acreage, then

  Total acreage needed = 28 acres/0.4 = **70 acres**

  If 70 acres is not available, stack debris higher

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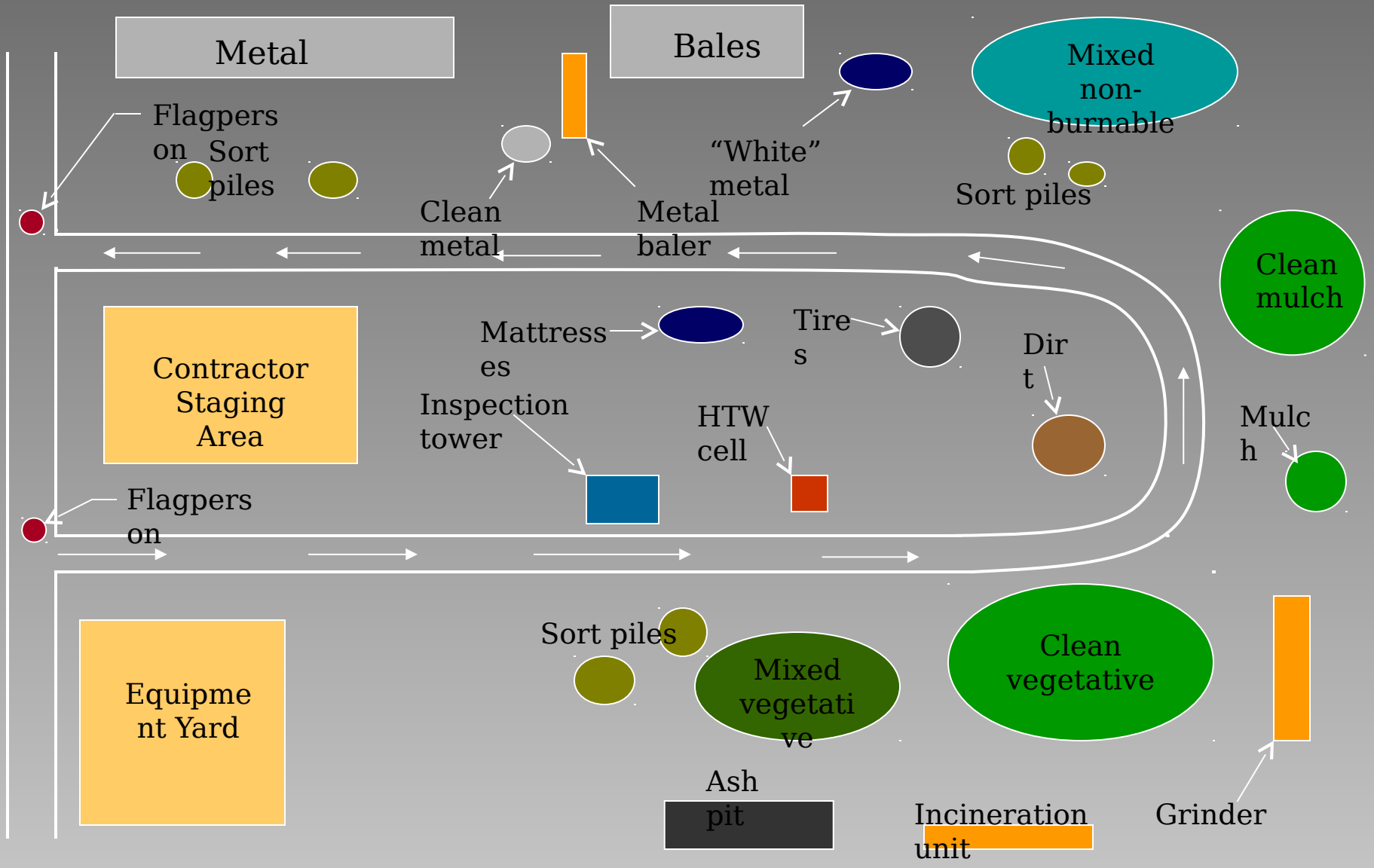
SIZE REQUIREMENTS

Storageville
Self Storage Suites
Climate Controlled • High Security
• All Indoor
452-4667
Pass Christian
Use This Truck
Call!

DEBRIS SITE LAYOUT



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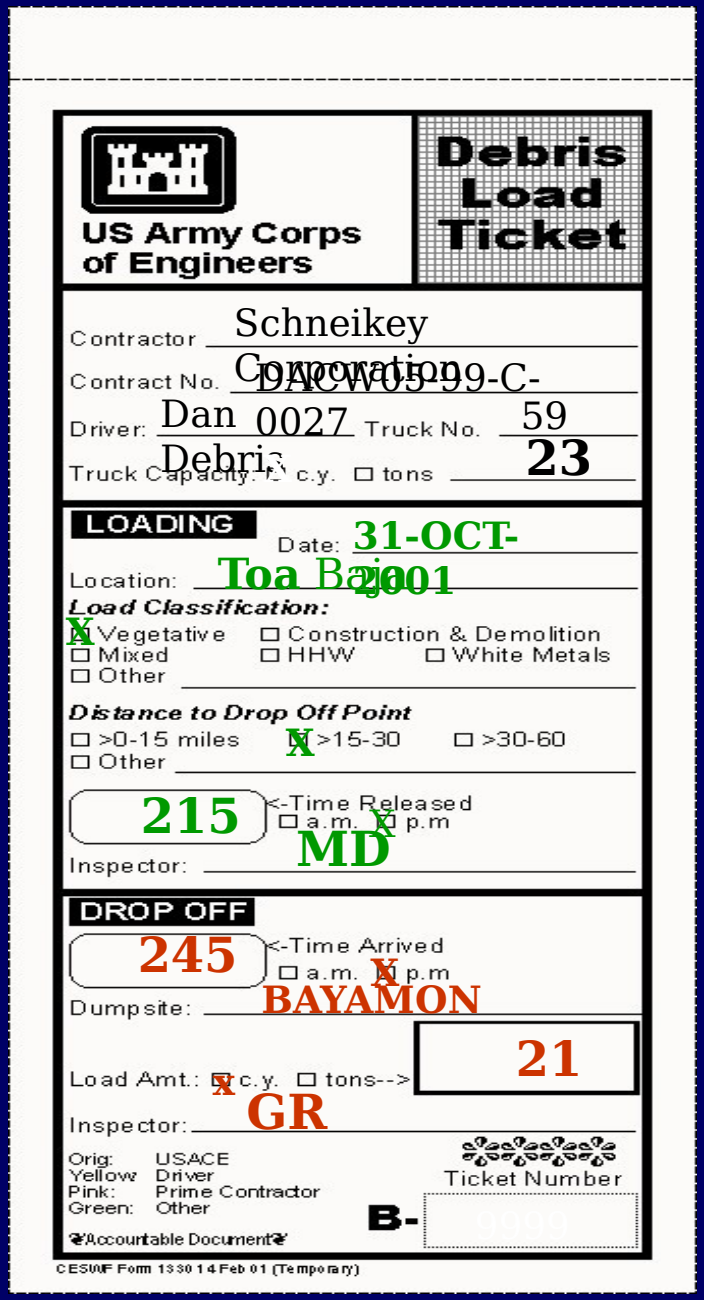
DEBRIS MANAGEMENT SITE LAYOUT

REDUCTION SITE SAFETY

HAUL TICKETS



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Debris Load Ticket

Contractor: Schneikey Corporation

Contract No.: DACW05-99-C-

Driver: Dan 0027 Truck No.: 59

Truck Capacity: ☐ c.y. ☐ tons: 23

LOADING

Date: 31-OCT-2001

Location: Toa Baja

Load Classification:

X Vegetative ☐ Construction & Demolition

☐ Mixed ☐ HHW ☐ White Metals

☐ Other

Distance to Drop Off Point

☐ >0-15 miles X >15-30 ☐ >30-60

☐ Other

215 <-Time Released ☐ a.m. X p.m

Inspector: MD

DROP OFF

245 <-Time Arrived ☐ a.m. X p.m

Dumpsite: BAYAMON

Load Amt.: X c.y. ☐ tons--> 21

Inspector: GR

Orig: USACE
Yellow: Driver
Pink: Prime Contractor
Green: Other

Ticket Number

B- 0000

Accountable Document

CESWF Form 1330 14 Feb 01 (Temporary)

- No ticket, no money
- Simple, legible
- Load classification selected by ≥ 80 % representative (exceptions)
- “Mixed” if load is < 80% representative (exceptions)
- Landfill highly mixed, dirty loads
- “Drop off” section and pay quantity completed at DMS

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HTW

- Inadvertent deliveries or generated onsite
- Temporary storage
- No release to environment
- Leak proof cell w/cover to prevent rain entry

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GRINDING

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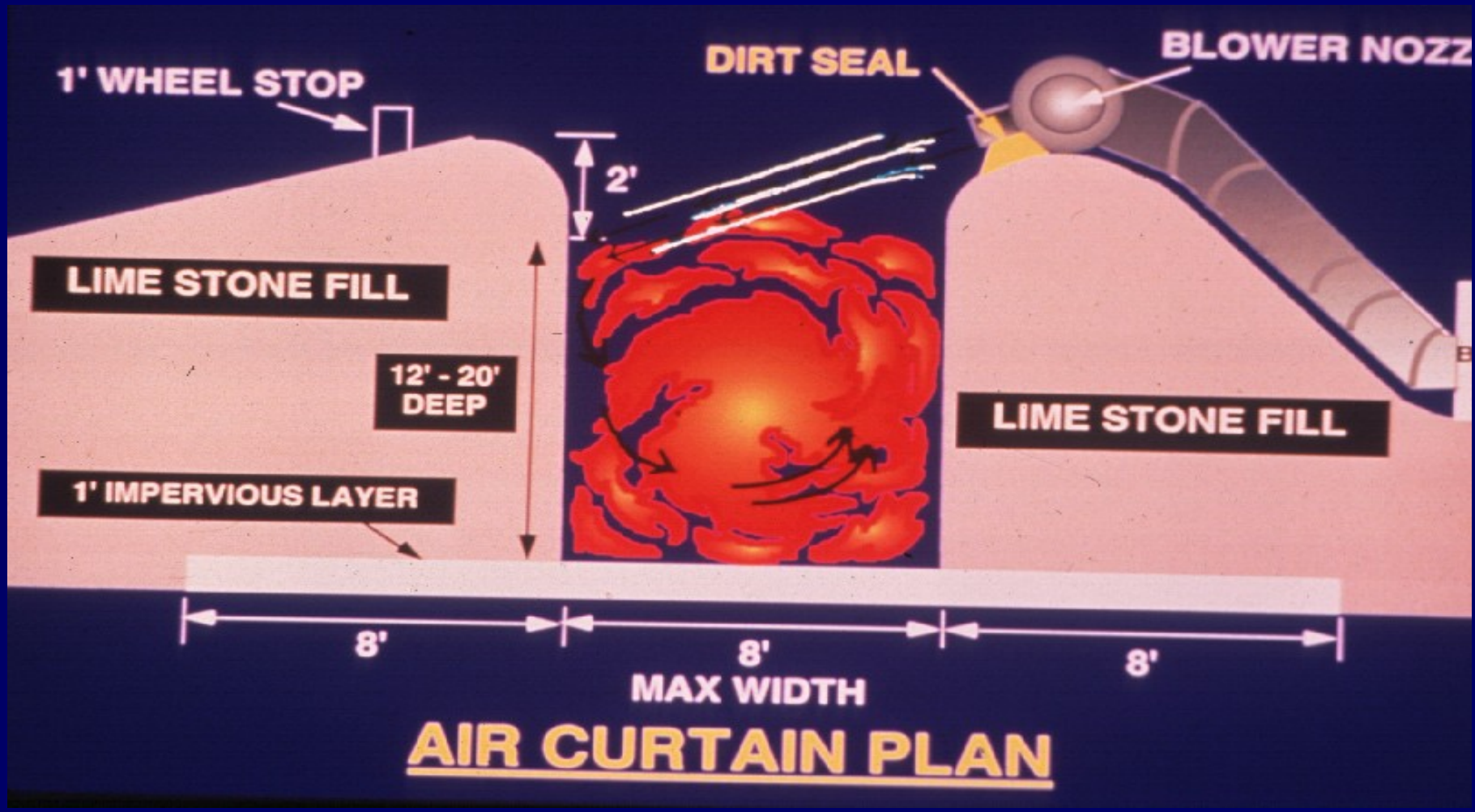
INCINERATION - AIR CURTAIN



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AIR CURTAIN INCINERATION

METAL PROCESSING

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FREON APPLIANCES

- Refrigerators, A/C, Freezers
- Segregate from all other appliances (carefully)
- Keep freon in tact
- EPA fines severe

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ULTIMATE DISPOSAL

- Mulch (wood chips): public, landfills
- Metal: shipped offsite to metal broker or recycler
- Tires: special pick-up; tires shredded and recycled
- Mattresses: landfilled
- Mixed: segregated as much as possible; land filled
- Ash: store in lined pit and test prior to disposal
- HTW: proper waste streams to disposal facility

FEMA may task other ESF to remove

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QUESTIONS